Do you know who we are? Undergraduate students' access to technology: A survey report

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Forum

This report presents findings from a quantitative survey of Japanese second year undergraduate students about their access to and ownership of technology. The survey collects information from 745 participants over seven academic terms. The responses reveal that students have access to and are using various types of technology from an increasingly young age. This report presents the data for the benefits of educators and administrators.

Introduction

Research investigating the benefits of Computer Assisted Language Learning in Japan is extensive. Ranging from blogs and podcasts to cell phone-based education and video production, students are being exposed to various affordances that technology provides them. However, few studies provide evidence of students' access to technology outside class time. Amongst the literature that does provide some information, the evidence is either provided as a discussion point, or it is utilized in a rather complacent style. For example, reporting on a blog project, Pinkman (2005) explains that after receiving in class training, students completed their blog projects at home. Pinkman provides no data concerning her students' access to technology outside class. Another research project reported that some of the participants "did not have Internet access at home" (Mebed, 2007; p. 102). Mebed became aware of students' lack of access to the Internet once the project was completed. Such information is important since it indicates the constraints that these students may face when attempting to complete the project on their own time.

In addition, very little evidence exists concerning Japanese students' computer skills prior to beginning their academic endeavors. The information available about junior high school students indicates that this group of learners is not accustomed to using technology. This fact is significant as Nakata (2008) explains that limited exposure to technology can affect comparative research outcomes.

The limited information available from the literature does not provide a clear view of students' access to technology. Instead it reports on random student questioning which does not assist the academic community in learning about the technological accessibility, needs and abilities of Japanese students (see Wang & Higgins, 2006 for example).

While it can be argued that as long as students can get access to technology, they will be able to develop their skills, the literature mentioned above clearly indicates that some students cannot complete CALL-based homework because they do not have access to the resources, and that the researchers aren't aware of this situation.

Therefore the scope of this research is simply to accumulate general statistical evidence that clearly represents a particular group of students' access to technology. The argument that emergences from this survey is that teachers should complete such surveys prior to conducting CALL classes in order to know more about their students and their ability to complete required activities.

The survey was conducted at Tohoku University over a three year period. A description of the participants and the data collection methods defines the parameters of the survey. The data gathered from the students' responses are organized as quantitative evidence. The data analysis aims to extrapolate some general data to reveal the extent to which students have access to technology. Based on the findings generated, the report concludes that it is useful for teachers to conduct surveys designed to collect information about students' access to technology, and their general abilities. Such information helps both researchers and teachers understand students working and living in an information technology-centered society.

Participants

Second year undergraduate students at Tohoku University participated in this research project. This group of students was selected because they were observed to possess enough English language ability to provide reliable responses. The participants were from various faculties, including Agriculture, Education, English, Engineering, Economics and Medicine. The students were informed about the purpose of the research project and its structure. Students were given the opportunity to indicate their consent to have their responses included in this research paper.

Methodology

Structured as a descriptive survey, the aim was to collect information concerning second year undergraduate students' access to and use of technology. Students completed the survey at the beginning of each term.

Ozok (2008) explains that sometimes little research is available to construct a survey. Survey items must therefore be generated either from evidence reported in the literature or by observing participants. The literature review conducted by Gromik (2009) revealed that Japan-based CALL researchers seldom conduct surveys aimed that divulging their

students' background and abilities. Therefore this survey was designed based on the lack of information available in the literature (Creswell, 2009).

First, a pilot study was conducted to test the language difficulty of the survey items and to address any ambiguities. The pilot study was timed to ensure that it was within the students' reach. Students could complete the whole survey in 50 minutes, however students had 90 minutes to complete it. Feedback received during the pilot study was used to improve question coherence (Burns, 2000). Nonetheless, while efforts were made to keep the questions and answer options within students' reading comprehension abilities, not all students find the survey within their reach. Therefore, students were allowed to seek clarification from the researcher, or they could use their electronic dictionary to assist them to express their opinion.

Thereafter, the data was collected over seven academic terms, thus generating evidence from seven different groups of participants. This approach helped increase the validity and reliability of the evidence outlined in this paper (Burns, 2000).

In line with descriptive survey structure, both closed and multiple choice questions were utilized to collect information from the participants. Closed questions collected data to construct an overview of the students' background and their access to technology. Such questions revealed whether or not students own iPods, for example. Multiple choice questions targeted information that reflects students' preferences. For example, some students may prefer to have Microsoft Windows rather than Apple Macintosh computers. The collection of responses was analyzed to provide a statistical overview of students' access to technology and its services. Open-ended questions were not considered since students may not have been able to provide sufficient information in English to extract reliable data. Jones and Marsden (2006) explain that some students might prefer yes/no to open-ended questions and this may affect the validity of the data collected.

One 90-minute class was scheduled for students to complete the survey which as divided into five sections: demographics, computers, cell phone, Internet access, and mp3 players. The demographics section asked for students' age and gender. The computer section inquired about students' earliest access to and familiarity with computers. This section required that students rate their computer ability in terms of beginner, intermediate or advanced. The cell phone section investigated whether or not students had access to a phone and inquired about their text messaging habits. The Internet section included a question concerning access at home and a multiple choice question to assess students' reasons for using the Internet at home. The mp3 section was a multiple choice question which asked students to indicate whether or not they had access to an iPod or other brand of mp3 player and asked if they would consider studying with this device.

Data Analysis

Quantitative data analysis was used to process the feedback provided by participants. The data was collected at the beginning of each term. The data was organized and tabulated with the OpenOffice Calc software. The overall data was then added to the general database of student responses. This information was then calculated to generate a statistical overview concerning students' access to and use of various technologies. By the end of seven academic terms, the evidence had generated a general and reliable perception of respondents' access to technology.

Findings

The findings were collected over seven academic terms and are described in two different periods. These periods include data collected in 2006 and data collected from 2007 to 2009. These periods are separated because of the appearance of new technological devices on the consumer market. As more research became available, the survey needed to be redesigned to include questions targeting access to specific technology. Therefore the overall data for 2006 to 2009 is outlined first. The second set of data collected between 2007 and 2009 reports on students' access to mp3 players and it is outlined last.

The data is reported either according to each academic term or as overall evidence. The label S1 06, for example, refers to the data generated from participants in the first semester of the year 2006 (see Table 1). The findings are categorized as: gender ratio per class, total number of participants, access to computer technology, length of computer ownership, exposure to computer training and self-perceived computer skills, ownership of cell phones, and access to an Internet connection. The next set of data concerns students' cell phone text messaging habits compared to computer-based emailing habits. The evidence gathered about access to mp3 technology is discussed at the end of the findings.

Data from 2006 onwards

Participants

A total of 763 participants (582 male, 182 female) completed the survey. Over seven academic terms, 18 students did not consent to have their answers included in this research. The high consent rate (n=745) reflects the participants' willingness to provide information that would be of benefit to the research community.

Access to technology

The figures in Table 1 refer to the type of computer students used. Two general sets of data are visible. First, the figures disclose the fact that while 32 students did not own a computer, 713 students did. These figures challenge evidence by Thornton and Houser (2005) who found that only 17% of their participants owned a computer at home. Second, the figures highlight a preference for Microsoft Windows computer (n=699), as opposed to Apple Macintosh computers (n=140). Furthermore, students seem to prefer laptops (n=524) over desktop computers (n=189). This report hypothesizes that students appreciate the mobility that laptops afford them.

While it can be argued that the Internet can be accessed through any operating system or computer brand, such information is important since it can assist universities in providing better technological infrastructures for future students and consumers who not only prefer a certain brand, but who will have more regular access to these computers at home and consequently will be more conversant with using such technology. To emphasis this point, spending funding on setting up an Apple computer lab for consumers who obviously are directed to purchase Microsoft personal computers is a waste of expenditure. It would be better to spend such funding in departments where Apple computers are required such as the filming department.

60   Until 2007 Windows XP was the preferred operating system by default. Windows Vista

became available on the market from 2007 onward and the presence of this operating system becomes apparent in the 2008 data. The figures for 2008 reveal that 127 students owned a Vista-operated computer compared to 53 students who owned Windows **XP**.

Table 1: Types of computers students own

	S1 06	**S2 06**	**S1 07**	**S2 07**	**S1 08**	**S2 08**	**S1 09**
Laptop XP	69	73	77	59	22	12	17
Laptop Mac	4	2	3	0	0	0	2
Desktop XP	25	24	45	23	9	10	15
Desktop Mac	0	0	3	0	0	0	0
No PC	4	5	6	6	3	2	6
Laptop Vista	0	0	0	0	51	62	71
Desktop Vista	0	0	0	0	5	9	21
Total	102	104	134	88	90	95	132

Added to the presence of Vista, and the new updated Windows Office Suite 2007, is the recent release of Windows 7. Tohoku University administrators and **CALL** researchers need to keep this in mind since students' newer computers may not be compatible with expensive older computers available in most computer laboratories. An upgrade for these computers is imminent if educators want to make the most of these facilities.

In terms of length of computer ownership, Figure 1 charts students' average length of computer ownership. Many students reported that they owned a computer for more than a year but less than two years.
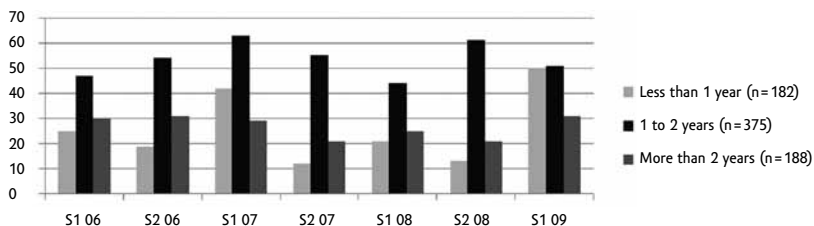

Figure 1. Length of Computer Ownership

Since the data were collected from second year undergraduate students, one may assume that they probably purchased their computers at the beginning of their academic studies, although there was no evidence to support this.

According to Table 2, the majority of students indicated that they had been exposed to computers since junior high school (n=304). A small number of participants (n=10) indicated that they never used a computer during their pre-university education.

Table 2: First exposure to computers

	Since JHS	Since SHS	Since Uni	Never
S1 06	11	31	56	2
S2 06	38	20	46	0
S1 07	50	50	34	3
S2 07	47	24	16	0
S1 08	40	24	25	1
S2 08	52	21	21	1
S1 09	66	34	29	3
Total	304	204	227	10

The survey also collected information to gauge students' perceptions of their computer skills. Students were provided with three categories. The "beginner" category defined users who would mainly use their computers to view movies, listen to music and type their academic papers using Microsoft Word.
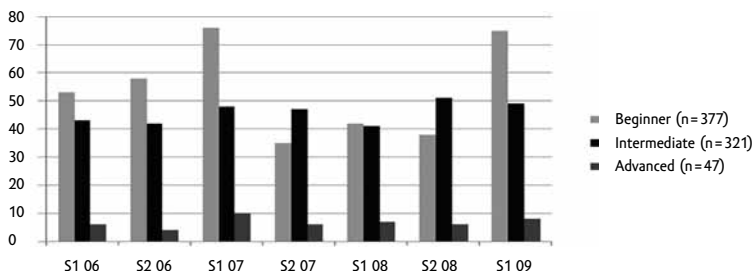

Figure 2. Self-perceived computer skills

The "intermediate" category was chosen by students who were able to use all of the software in the Microsoft Office Suite as well as other software. They were also comfortable with surfing the Internet for information. The last category, "advanced" was defined as "the ability to surf the Internet to download and install software, participate in chat groups, manage a blog, and email friends overseas". Figure 2 reveals that on average, students rated themselves as beginners.

While 50.6% (n=377) of the participants reported that they are beginners, 6.3% (n=47) of the participants perceived themselves as advanced users. The remaining 43% of the participants (n=321) perceived themselves as intermediate users. Such figures are interesting especially when contrasted with students' prior school-based experience with computers. In total, 504 (67%) students reported using a computer either since junior or senior high school, and yet these students perceive themselves for the most part as beginners. It would be invaluable to conduct further research in the type of computer training students receive during their schooling. It could be argued that not only do schools have computer labs, but that these are mostly used for research and not for imparting students with computer skills such as designing a power point.

The next part of the survey collected information regarding access to cell phones. All respondents had access to a cell phone. This data remained constant over the different

academic terms.

The majority of respondents acquired their first cell phone between the age of 15 and 19 years old (n=427) (see Figure 3).
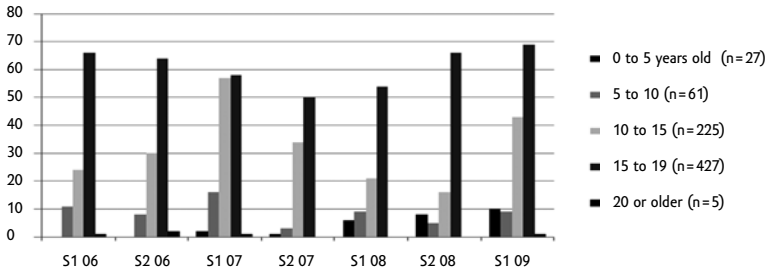

Figure 3. Age of cell phone ownership

The next major age group to acquire a cell phone was between 10 and 15 years old (n=225). Very few respondents acquired their first cell phone after 20 years of age (n=5) or before 5 years of age (n=27). Nonetheless, more and more students have access to a cell phone from an early age. Results showed that 61 respondents indicated receiving a cell phone between the age of 5 and 10.

Cell phone text messaging habits indicate that students were most likely to send 1 to 5 messages per day. Out of 745 respondents, 322 sent 1 to 5 messages per day. 267 respondents indicated sending 5 to 10 messages per day. The remaining 156 respondents sent more than 10 messages per day. The consistency of these responses conflicts with Thornton and Houser (2005) experiment, which reported that their students sent an average 200 text messages per week.

Cell phone text messaging can be contrasted against the number of Internet-based emails sent. First, the data reports on student access to the Internet at home before drawing some comparisons.

Only 33 respondents did not have access to the Internet at home. The remaining 712 students had an Internet connection at home. The data informs university administrators that the high ratio of students with access to the Internet allows for the possibility of delivering educational content online.
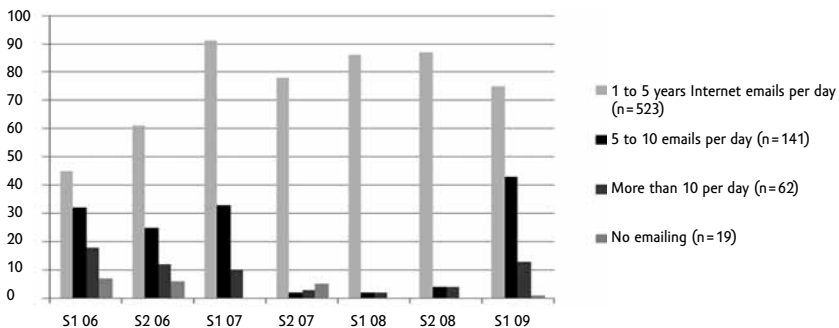

Figure 4. Computer-based emails sent per day

63

In line with cell phone-based text messaging habits, it appears that the majority of students sent an average of 1 to 5 computer-based emails per day (see Figure 4). While this data provides some information about students' computer-based emailing, it does not explore the types of websites students access via their home Internet connection.

Summary

Most students had prior experience with using computers since junior high school. The majority had access to a cell phone since they were between 10 and 19 years old, and most acquired a computer prior to commencing their undergraduate studies. Technology is a part of their lives and as the next set of data indicates, it is no longer just computers and cell phones that students have access to, but a greater and more mobile range of technology.

mp3 data, 2007 onwards

Nascent in 2001, the iPod is an mp3 player that has revolutionized the availability of audio-visual resources. Students have been reported to use this device to store information to undertake their studies, leading to a potential ban at some American schools (Boone, 2007). This has not stopped educators in Japan from considering mp3 technology as a language learning device (see McCarty, 2005 and Valance & Shibata, 2008 for examples).

In 2007, 226 students responded to the following two questions: "Do you own an iPod?" and "Would you agree with using an iPod to study English?" The data revealed that 72 respondents had access to an iPod player only, while 154 students did not have access this device. Some students stated that they used other mp3 players such as Sony or Iriver. To include all the major mp3 player brand names was beyond the scope of the survey. Therefore in 2008, the survey item "mp3 player" was added. Out of 325 respondents, 125 students did not own an iPod or an mp3 player. Amongst the group of students who reported having an mp3 player, 141 owned an iPod and 59 indicated that they owned a different brand. A few selected respondents were approached to investigate their decision for selecting other brands. The majority responded that iPods were too costly for their particular needs. Such information is of some importance because students have financial constraints that dictate their choice of technology. Still, as technological developments render hardware more affordable, increasing numbers of students are investing in portable technology.

During 2007 and 2008, students were asked if they would consider studying English with their mp3 player. Some respondents indicated that they would like to study English with an mp3 player (n=286), while others were not interested in learning via this device (n=253).

There was no major difference between semesters that revealed a clear understanding of students' preferences with regard to learning with an mp3 player. It may be the case that once students were exposed to learning with an mp3 player, they saw some educational benefits with this tool (see Gromik, 2008 for an example).

Limitations

Due to respondents' limited ability to respond promptly and thoroughly to open-ended questions in English, this survey was unable to delve into qualitative data. For example, attempting to seek out students' reasoning behind issues such as their preference for

Microsoft over Apple computers may have impeded them in answering all questions within the time allocated to complete the survey.

In terms of survey design, a limiting factor is the constant technology upgrades and developments available to consumers. These changes mean that for researchers to keep track of students' access to technology, surveys need to be frequently updated. This survey report exemplified the research constraints that technological development imposed when reporting on students' ownership of mp3 devices. With current development in Web 2.0, researchers might investigate social networking sites, and students' preferences for managing websites.

Concerning survey items, it is beyond the scope of any reasonable survey to ask all imaginable questions. Nonetheless, the evidence provided in this article provide researchers with areas for investigations. For example, it might be of interest to the **CALL** community to know more about the types of activities that students undertake at junior and senior high schools. It might also be of interest for researchers to understand the influence that parents' experience with technology has on students willingness to adopt technology in their daily life and educational environment.

Implications

The limitations outlined above provide areas for further research and this survey report provides information that has implications for researchers. For example it might be feasible to conduct a correlation study between computer requirements at university and students' familiarity with various types of software. This could be an area for further investigation to determine how and if computer usage increases as teachers begin to assign more computer-based tasks.

For **CALL** infrastructure administrators, this report offers some indications not only about students' access to technology but also the constant technological changes that emerge. This is important because Microsoft first furnished selected computers with a Windows **XP** operating system. While this operating system remains the preferred option, Microsoft has released Windows Vista and 7 which consumers are purchasing.

Constant technological development could guide **CALL** infrastructure administrators to consider various types of services to provide on the university **CALL** computers. For example, Gromik (2008) reported on the benefits of learning with iTunes, an Apple audio-visual delivery website (see also O'Bryan & Hegelheimer, 2007). Providing this service on campus may benefit students and educators alike with authentic learning resources.

Conclusion

This paper reported on a survey conducted over seven academic terms at Tohoku University. 745 students from various departments consented to provide evidence concerning their prior experience with technology. The data reported on students' access to and use of technology outside of class. The information revealed that students have greater and earlier access to computers, cell phones and mp3 players. Students' familiarity with these devices varies depending on their length of exposure and training. This survey report also indicated that due to rapid technology development, it is essential to update survey questions and keep track of recent trends and updates. New developments also affect students' familiarity with technology and their use of it on a daily basis. This author concludes that it may

be time for educators and administrators to consider further investigating the effect of integrating technology on a wider scale.

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